Name: Date:

Polynomial Factoring solution (version 695)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 44 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(44)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 176}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-32}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{12 \pm 4\sqrt{2}\, i}{2}$$

$$x = 6 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 4i$ and $8 + 3i$ in standard form ($a + bi$).**

Solution

$$(-2 + 4i) \cdot (8 + 3i)$$

$$-16 - 6i + 32i + 12i^2$$

$$-16 - 6i + 32i - 12$$

$$-16 - 12 - 6i + 32i$$

$$-28 + 26i$$

Polynomial Factoring solution (version 695)

3. **Write function $f(x) = x^3 - 14x^2 + 63x - 90$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	-14	63	-90
5		5	-45	90
	1	-9	18	0

$$f(x) = (x-5)(x^2 - 9x + 18)$$

$$f(x) = (x-5)(x-6)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6)^2 \cdot (x+2) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.